Amendments to the Claims:

The listing of the claims will replace all prior versions and listings of the claims in the application:

Listing of the Claims:

1. (original): A prosthetic knee joint comprising:

a first joint member,

a first joint member bone fixation portion, said first joint member bone fixation portion being adapted to be securable to a bone,

a first joint member load bearing and articulation portion,

a first joint member polycrystalline diamond compact, said first joint member polycrystalline diamond compact serving to form at least a portion of said first joint member load bearing and articulation portion,

a first joint member polycrystalline diamond compact substrate, said substrate being located on said first joint member polycrystalline diamond compact,

a first joint member polycrystalline diamond compact diamond table sintered to said first joint member polycrystalline diamond compact substrate,

solvent-catalyst metal located in said first joint member polycrystalline diamond compact,

a first joint member gradient transition zone between said first joint member polycrystalline diamond compact substrate and said first joint member polycrystalline diamond compact diamond table, said first joint member gradient transition zone having a substrate side and a diamond table side, said first joint member gradient transition zone having both solvent-catalyst metal and diamond therein, and said first joint member gradient transition zone exhibiting a transition of ratios of percentage content of solvent catalyst metal to diamond from one side of said gradient transition zone to another side such that at a first point in said first joint member gradient transition zone near said substrate side, the ratio of percentage content of

solvent-catalyst metal to diamond is greater than it is at a second point in said first joint member gradient transition zone closer to said diamond side than said first point,

chemical bonds between said first joint member polycrystalline diamond compact diamond table and said first joint member polycrystalline diamond compact substrate which tend to secure said diamond table to said substrate,

a mechanical grip between said first joint member polycrystalline diamond compact diamond table and said first joint member polycrystalline diamond compact substrate which tends to secure said diamond table to said substrate,

a first joint member load bearing and articulation surface, said first joint member load bearing and articulation surface including sintered polycrystalline diamond of said first joint member polycrystalline diamond compact, said sintered polycrystalline diamond providing a smooth and low-friction first joint member load bearing and articulation surface,

a second joint member,

a second joint member bone fixation portion, said second joint member bone fixation portion being adapted to be securable to a bone,

a second joint member load bearing and articulation portion,

a second joint member polycrystalline diamond compact, said second joint member polycrystalline diamond compact serving to form at least a portion of said second joint member load bearing and articulation portion,

a second joint member polycrystalline diamond compact substrate, said substrate being located on said second joint member polycrystalline diamond compact,

a second joint member polycrystalline diamond compact diamond table sintered to said second joint member polycrystalline diamond compact substrate, solvent-catalyst metal located in said second joint member polycrystalline diamond compact,

a second joint member gradient transition zone between said second joint member

polycrystalline diamond compact substrate and said second joint member polycrystalline diamond compact diamond table, said second joint member gradient transition zone

having a substrate side and a diamond table side, said second joint member gradient transition zone having both solvent-catalyst metal and diamond therein, and said second joint member gradient transition zone exhibiting a transition of ratios of percentage content of solvent-catalyst metal to diamond from one side of said gradient transition zone to another side such that at a first point in said second joint member gradient transition zone near said substrate side, the ratio of percentage content of solvent-catalyst metal to diamond is greater than it is at a second point in said second joint member gradient transition zone closer to said diamond side than said first point,

chemical bonds between said second joint member polycrystalline diamond compact diamond table and said second joint member polycrystalline diamond compact substrate which tend to secure said diamond table to said substrate,

a mechanical grip between said second joint member polycrystalline diamond compact diamond table and said second joint member polycrystalline diamond compact substrate which tends to secure said diamond table to said substrate, and

a second joint member load bearing and articulation surface, said second joint member load bearing and articulation surface including sintered polycrystalline diamond of said second joint member polycrystalline diamond compact, said sintered polycrystalline diamond providing a smooth and low-friction second joint member load bearing and articulation surface.

2. (original): A joint as recited in claim 1 further comprising topographical features on at least one of said substrates, said topographical features serving to enhance said mechanical grip between the substrate and its corresponding diamond table.

3. (original): A joint as recited in claim 1 wherein said first joint member load bearing and articulation surface has a convex shape and wherein said second joint member load bearing and articulation surface has a concave shape.

4. (original): A joint as recited in claim 1 wherein at least one of said first and said

second joint member load bearing and articulation surface has an arcuate shape.

5. (original): A joint as recited in claim 1 wherein at least one of said first and said second joint member load bearing and articulation surface has a hemispherical shape.

6. (original): A joint as recited in claim 1 further comprising an interface present between at least one of said substrates and its diamond table.

7. (original): A joint as recited in claim 1 further comprising solvent-catalyst metal present in said substrate.

8. (original): A joint as recited in claim 7 wherein said solvent-catalyst metal present in said substrate is the same solvent-catalyst metal present in said diamond table.

9. (original): A joint as recited in claim 1 further comprising interstitial spaces in at least one of said diamond tables.

10. (original): A joint as recited in claim 1 further comprising solvent-catalyst metal located in at least one of said diamond tables.

11. (original): A joint as recited in claim 1 further comprising a residual stress field in at least one of said polycrystalline diamond compacts, said residual stress field tending to enhance strength of said polycrystalline diamond compact.

12. (original): A joint as recited in claim 1 wherein diamond in at least one of said polycrystalline diamond compacts has a coefficient of thermal expansion CTE_{Cd}, and wherein its corresponding substrate has a coefficient of thermal expansion CTE_{sub}, and wherein CTE_{Cd} is not equal to CTE_{sub}.

13. (original): A joint as recited in claim 1 wherein in at least one of said polycrystalline diamond compacts, the diamond has a modulus M_{Cd}, and the substrate has a modulus M_{sub}, and wherein M_{Cd}, is not equal to M_{sub}.

14. (original): A joint as recited in claim 1 further comprising a crystalline diamond structure in at least one of said diamond tables.

15. (original): A joint as recited in claim 1 wherein at least one of said load bearing and articulation surfaces has an Ra value of between about 0.01 to about 0.005 microns.

16. (original): A joint as recited in claim 1 wherein at least one of said polycrystalline diamond load bearing and articulation surfaces is burnished.

17. (original): A joint as recited in claim 1 wherein at least one of said first and said second joint member bone fixation portions is shaped to be press fit into a receptacle formed in a bone.

18. (original): A joint as recited in claim 1 wherein at least one of said first and said second joint member bone fixation portions includes a bone mating surface on at least a portion of its exterior.

19. (original): A joint as recited in claim 1 wherein at least one of said first and said second joint member bone fixation portions includes a bone mating surface on at least a portion of its exterior that includes features which enhance frictional engagement with a bone.

20. (original): A joint as recited in claim 1 wherein at least one of said first and said second joint member bone fixation portions includes a bone mating surface on at least a portion of its exterior that permits osseointegration.

21. (original): A joint as recited in claim 1 wherein at least one of said first and said second joint member bone fixation portions includes a bone mating surface on at least a portion of its exterior that includes a surface coating which encourages bone growth against said coating.

22. (original): A joint as recited in claim 1 further comprising a bone mating surface on at least a portion the joint, said bone mating surface including a structure selected from the group consisting of metal mesh, porous metal, porous diamond, metal sintered beads, and plasma spray metal.

23. (original): A joint as recited in claim 1 wherein at least one of said first and said second joint member bone fixation portions is shaped to permit bone fixation to be accomplished by use of at least one mechanical fastener.

24. (original): A joint as recited in claim 1 wherein at least one of said substrates includes a metal alloy with at least one component of said metal alloy being selected from the group consisting of titanium, aluminum, vanadium, molybdenum, hafnium, nitinol, cobalt, chrome, molybdenum, tungsten, cemented tungsten carbide, cemented chrome carbide, fused silicon carbide, nickel, tantalum, and stainless steel.

25. (original): A joint as recited in claim 1 wherein at least one of said substrates includes CoCr as a solvent-catalyst metal.

26. (original): A joint as recited in claim 1 wherein at least one of said substrates includes a plurality of substrate layers.

27. (original): A joint as recited in claim 1 wherein at least one of said substrates includes at least two distinct substrate layers of different metals.

28. (original): A joint as recited in claim 1 wherein at least one of said diamond tables includes diamond crystals of at least two different dimensions.

29. (currently amended): A prosthetic knee joint comprising:

a first joint member,

a first joint member bone fixation portion, said first joint member bone fixation portion being adapted to be securable to a bone,

a first joint member load bearing and articulation portion, a second joint member,

a second joint member bone fixation portion, said second joint member bone fixation portion being adapted to be securable to a bone,

a second joint member load bearing and articulation portion,

a second joint member polycrystalline diamond compact, said second joint member polycrystalline diamond compact serving to form at least a portion of said second joint member load bearing and articulation portion,

a second joint member polycrystalline diamond compact substrate, said substrate being located on said second joint member polycrystalline diamond compact,

a second joint member polycrystalline diamond compact diamond table sintered to said second joint member polycrystalline diamond compact substrate, solvent-catalyst metal located in said second joint member polycrystalline diamond compact,

a second joint member gradient transition zone between said second joint member polycrystalline diamond compact substrate and said second joint member polycrystalline diamond compact diamond table, and

a second joint member load bearing and articulation surface, said second joint member load bearing and articulation surface including sintered polycrystalline diamond, said sintered polycrystalline diamond providing a smooth and low-friction second joint member load bearing and articulation surface[[.]],

having solvent-catalyst metal located in said second joint member polycrystalline diamond compact.

Claim 30 (cancelled).

31. (currently amended): A prosthetic knee joint comprising:

a first joint member,

a first joint member bone fixation portion, said first joint member bone fixation portion being adapted to be securable to a bone,

a first joint member load bearing and articulation portion, a second joint member,

a second joint member bone fixation portion, said second joint member bone fixation portion being adapted to be securable to a bone,

a second joint member load bearing and articulation portion,

a second joint member polycrystalline diamond compact, said second joint member

polycrystalline diamond compact serving to form at least a portion of said second joint member load bearing and articulation portion, said second joint member polycrystalline diamond compact having solvent-catalyst metal located within it,

a second joint member polycrystalline diamond compact substrate, said substrate being located on said second joint member polycrystalline diamond compact,

a second joint member polycrystalline diamond compact diamond table sintered to said second joint member polycrystalline diamond compact substrate, solvent-catalyst metal located in said second joint member polycrystalline diamond compact,

a second joint member gradient transition zone between said second joint member polycrystalline diamond compact substrate and said second joint member polycrystalline diamond compact diamond table,

~~A joint as recited in claim 29 wherein said a second joint member gradient transition zone is located between said second joint member polycrystalline diamond compact substrate and said second joint member polycrystalline diamond compact diamond table, and~~ wherein said second joint member gradient transition zone has a substrate side and a diamond table side, said second joint member gradient transition zone having both solvent-catalyst metal and diamond therein, and said second joint member gradient transition zone exhibiting a transition of ratios of percentage content of solvent-catalyst metal to diamond from one side of said gradient transition zone to another side such that at a first point in said second joint member gradient transition zone near said substrate side, the ratio of percentage content of solvent-catalyst metal to diamond is greater than it is at a second point in said second joint member gradient transition zone closer to said diamond side than said first point[[.]], and

a second joint member load bearing and articulation surface, said second joint member load bearing and articulation surface including sintered polycrystalline diamond, said sintered polycrystalline diamond providing a smooth and low-friction second joint member load bearing and articulation surface.

32. (currently amended): A joint as recited in claim [[29]]31 further comprising chemical bonds between said second joint member polycrystalline diamond compact diamond

table and said second joint member polycrystalling diamond compact substrate which tend to secure said diamond table to said substrate.

33. (currently amended): A joint as recited in claim [[29]]<u>31</u> further comprising a mechanical grip between said second joint member polycrystalline diamond compact diamond table and said second joint member polycrystalline diamond compact substrate which tends to secure said diamond table to said substrate.

34. (original): A joint as recited in claim 33 further comprising topographical features on at least one of said substrates, said topographical features serving to enhance said mechanical grip between the substrate and its corresponding diamond table.

35. (currently amended): A joint as recited in claim [[29]]<u>31</u> wherein said second joint member load bearing and articulation surface has a shape selected from the group consisting of concave, convex, arcuate, hemispherical and partially spherical.

36. (currently amended): A joint as recited in claim [[29]]<u>31</u> further comprising a residual stress field <u>in</u> said polycrystalline diamond compact, said residual stress field tending to enhance the strength of said polycrystalline diamond compact.

37. (currently amended): <u>A prosthetic knee joint comprising:</u>

<u>a first joint member,</u>

<u>a first joint member bone fixation portion, said first joint member bone fixation portion being adapted to be securable to a bone,</u>

<u>a first joint member load bearing and articulation portion, a second joint member,</u>

<u>a second joint member bone fixation portion, said second joint member bone fixation portion being adapted to be securable to a bone,</u>

<u>a second joint member load bearing and articulation portion,</u>

<u>a second joint member polycrystalline diamond compact, said second joint member polycrystalline diamond compact serving to form at least a portion of said second joint member</u>

load bearing and articulation portion,

a second joint member polycrystalline diamond compact substrate, said substrate being located on said second joint member polycrystalline diamond compact,

a second joint member polycrystalline diamond compact diamond table sintered to said second joint member polycrystalline diamond compact substrate, solvent-catalyst metal located in said second joint member polycrystalline diamond compact,

a second joint member gradient transition zone between said second joint member polycrystalline diamond compact substrate and said second joint member polycrystalline diamond compact diamond table, and

a second joint member load bearing and articulation surface, said second joint member load bearing and articulation surface including sintered polycrystalline diamond, said sintered polycrystalline diamond providing a smooth and low-friction second joint member load bearing and articulation surface, and

~~A joint as recited in claim 29~~ wherein diamond in said polycrystalline diamond compact has a coefficient of thermal expansion CTE_{Cd}, and wherein said corresponding substrate has a coefficient of thermal expansion CTE_{sub}, and wherein CTE_{Cd} is not equal to CTE_{sub}.

38. (currently amended): A prosthetic knee joint comprising:

a first joint member,

a first joint member bone fixation portion, said first joint member bone fixation portion being adapted to be securable to a bone,

a first joint member load bearing and articulation portion, a second joint member,

a second joint member bone fixation portion, said second joint member bone fixation portion being adapted to be securable to a bone,

a second joint member load bearing and articulation portion,

a second joint member polycrystalline diamond compact, said second joint member polycrystalline diamond compact serving to form at least a portion of said second joint member load bearing and articulation portion,

a second joint member polycrystalline diamond compact substrate, said substrate being located on said second joint member polycrystalline diamond compact,

a second joint member polycrystalline diamond compact diamond table sintered to said second joint member polycrystalline diamond compact substrate, solvent-catalyst metal located in said second joint member polycrystalline diamond compact,

a second joint member gradient transition zone between said second joint member polycrystalline diamond compact substrate and said second joint member polycrystalline diamond compact diamond table, and

a second joint member load bearing and articulation surface, said second joint member load bearing and articulation surface including sintered polycrystalline diamond, said sintered polycrystalline diamond providing a smooth and low-friction second joint member load bearing and articulation surface, and

~~A joint as recited in claim 29~~ wherein in said polycrystalline diamond compact, the diamond has a modulus M_{Cd}, and the substrate has a modulus M_{sub}, and wherein M_{Cd} is not equal to M_{sub}.

39. (currently amended): A joint as recited in claim [[29]]38 wherein said second joint member load bearing and articulation surface has an Ra value of between about 0.01 to about 0.005 microns.

40. (currently amended): A joint as recited in claim [[29]]38 wherein said polycrystalline diamond load bearing and articulation surface is burnished.

41. (currently amended): A joint as recited in claim [[29]]38 wherein at least one of said first and said second joint member bone fixation portions is shaped to be press fit into a receptacle formed in a bone.

42. (currently amended): A joint as recited in claim [[29]]38 wherein at least one of said first and said second joint member bone fixation portions includes a bone mating surface on at least a portion of its exterior.

43. (currently amended): A joint as recited in claim [[29]]38 wherein at least one of said first and said second joint member bone fixation portions includes a bone mating surface on at least a portion of its exterior that includes features which enhance frictional engagement with a bone.

44. (currently amended): A joint as recited in claim [[29]]38 wherein at least one of said first and said second joint member bone fixation portions includes a bone mating surface on at least a portion of its exterior, said bone mating surface including a structure selected from the group consisting of metal mesh, porous metal, porous diamond, metal sintered beads, and plasma spray metal.

45. (currently amended): A joint as recited in claim [[29]]38 wherein at least one of said first and said second joint member bone fixation portions includes a bone mating surface on at least a portion of its exterior that includes a surface coating which encourages bone growth against said coating.

46. (original): A joint as recited in claim 45 wherein said coating includes hydroxyl apatite.

46. (currently amended): A joint as recited in claim [[29]]38 wherein at least one of said first and said second joint member none fixation portions is shaped to permit bone fixation to be accomplished by use of at least one mechanical fastener.

48. (currently amended): A joint as recited in claim [[29]]38 wherein said substrate includes at least one metal selected from the group consisting of cobalt, chrome, titanium, tungsten, molybdenum and iron.

49. (currently amended): A joint as recited in claim [[29]]38 wherein said substrate includes a metal alloy selected from the group consisting of titanium, titanium aluminum and vanadium, titanium molybdenum hafnium, titanium and nitinol, cobalt chrome, cobalt chrome

molybdenum, cobalt chrome tungsten, cobalt chrome cemented tungsten carbide, cobalt chrome cemented chrome carbide, fused silicon carbide and stainless steel.

50. (currently amended): A joint as recited in claim [[29]]38 wherein said substrate includes a plurality of substrate layers.

51. (currently amended): A joint as recited in claim [[29]]38 wherein said substrate includes at least two distinct substrate layers of different metals.

52. (currently amended): A joint as recited in claim [[29]]38 wherein said diamond table includes diamond crystals of at least two different dimensions.

53. (currently amended): A joint as recited in claim [[29]]38 further comprising a first joint member load bearing and articulation surface, said first joint member load bearing and articulation surface including a counter bearing material against which said second joint member load bearing and articulation surface polycrystalline diamond may articulate.

54. (original): A joint as recited in claim 53 wherein said counter bearing material includes a material selected from the group consisting of monocrystal diamond, natural diamond, polycrystalline diamond, CVD diamond, PVD diamond, cubic boron nitride, wurzitic boron nitride, ceramic, cobalt-chrome alloy, titanium alloy, nickel, vanadium, tantalum, hafnium, molybdenum, cemented tungsten carbide, niobium, zirconia ceramic, alumina ceramic, polymers, UHMWPE, PEEK, cross-linked polymers and sapphire.

55. (currently amended): A joint as recited in claim [[29]]38 wherein said first joint member load bearing and articulation surface counter bearing material is not as hard as said second joint member load bearing and articulation surface.

56. (currently amended): A prosthetic knee joint comprising:

a first joint member,

a first joint member bone fixation portion, said first joint member bone fixation portion being adapted to be securable to a bone,

a first joint member load bearing and articulation portion, a second joint member,

a second joint member bone fixation portion, said second joint member bone fixation portion being adapted to be securable to a bone,

a second joint member load bearing and articulation portion,

a load bearing and articulation surface located on said second joint member load bearing and articulation portion, ~~and~~

a volume of diamond located on said load bearing and articulation portion, said volume of diamond material forming at least a portion of said load bearing and articulation surface[[.]],

wherein polycrystalline diamond is present in said volume of diamond, and

wherein said polycrystalline diamond has a coefficient of thermal expansion CTE_{Cd}, and said substrate has a coefficient of thermal expansion CTE_{sub}, and wherein CTE_{Cd} is not equal to CTE_{sub}.

57. (original): A joint as recited in claim 56 said volume of diamond comprises polycrystalline diamond and wherein said second joint member load bearing and articulation portion comprises a substrate to which said polycrystalline diamond is sintered.

58. (original): A joint as recited in claim 57 further comprising a gradient transition zone between polycrystalline diamond and said substrate.

59. (original): A joint as recited in claim 58 further comprising chemical bonds between said polycrystalline diamond and said substrate.

60. (original): A joint as recited in claim 59 further comprising a mechanical grip between said polycrystalline diamond and said substrate.

61. (original): A joint as recited in claim 60 further comprising topographical features on said substrate, said topographical features serving to enhance said mechanical grip between said substrate and said polycrystalline diamond..

62. (original): A joint as recited in claim 59 wherein said polycrystalline diamond and said substrate comprise a polycrystalline diamond compact.

63. (original): A joint as recited in claim 62 further comprising a residual stress field in said polycrystalline diamond compact, said residual stress field tending to enhance strength of said polycrystalline diamond compact.

64. (currently amended): A prosthetic knee joint comprising:

a first joint member,

a first joint member bone fixation portion, said first joint member bone fixation portion being adapted to be securable to a bone,

a first joint member load bearing and articulation portion, a second joint member,

a second joint member bone fixation portion, said second joint member bone fixation portion being adapted to be securable to a bone,

a second joint member load bearing and articulation portion,

a load bearing and articulation surface located on said second joint member load bearing and articulation portion, and

a volume of diamond located on said load bearing and articulation portion, said volume of diamond material forming at least a portion of said load bearing and articulation surface,

said volume of diamond comprises polycrystalline diamond and wherein said second joint member load bearing and articulation portion comprises a substrate to which said polycrystalline diamond is sintered,

a gradient transition zone between polycrystalline diamond and said substrate, having chemical bonds between said polycrystalline diamond and said substrate,

wherein said polycrystalline diamond and said substrate comprise a polycrystalline diamond compact,

a residual stress field in said polycrystalline diamond compact, said residual stress field tending to enhance strength of said polycrystalline diamond compact, and

~~A joint as recited in claim 63~~ wherein said polycrystalline diamond has a coefficient of thermal expansion CTE_{Cd}, and said substrate has a coefficient of thermal expansion CTE_{sub}, and wherein CTE_{Cd} is not equal to CTE_{sub}.

65. (currently amended): A prosthetic knee joint comprising:

a first joint member,

a first joint member bone fixation portion, said first joint member bone fixation portion being adapted to be securable to a bone,

a first joint member load bearing and articulation portion, a second joint member,

a second joint member bone fixation portion, said second joint member bone fixation portion being adapted to be securable to a bone,

a second joint member load bearing and articulation portion,

a load bearing and articulation surface located on said second joint member load bearing and articulation portion, and

a volume of diamond located on said load bearing and articulation portion, said volume of diamond material forming at least a portion of said load bearing and articulation surface,

said volume of diamond comprises polycrystalline diamond and wherein said second joint member load bearing and articulation portion comprises a substrate to which said polycrystalline diamond is sintered,

a gradient transition zone between polycrystalline diamond and said substrate, having chemical bonds between said polycrystalline diamond and said substrate,

wherein said polycrystalline diamond and said substrate comprise a polycrystalline diamond compact,

a residual stress field in said polycrystalline diamond compact, said residual stress field tending to enhance strength of said polycrystalline diamond compact,

wherein said polycrystalline diamond has a coefficient of thermal expansion CTE_{Cd}, and said substrate has a coefficient of thermal expansion CTE_{sub}, and wherein CTE_{Cd} is not equal to CTE_{sub}, and

~~A joint as recited in claim 63~~ wherein in said polycrystalline diamond has a modulus MCd, and said substrate has a modulus Msub, and wherein MCd, is not equal to Msub.

66. (original): A joint as recited in claim 56 wherein said diamond articulation surface has an Ra value of between about 0.5 to about 0.005 microns.

67. (original): A joint as recited in claim 56 wherein said diamond is selected from the group consisting of natural diamond, monocrystal diamond, polycrystalline diamond, CVD diamond and PVD diamond.

Claims 68-100 (previously cancelled).